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Electric Light & Power

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Brazilian hydro plant dedicated

Power from the massive 12,600-MW Itaipu hydroelectric project is now moving to Brazilian load centers via a ±600-kv d-c transmission system designed and built by ASEA of Sweden following dedication of the jointly owned project by President Figueredo of Brazil and President Stroessner of Paraguay on October 25. Paraguay's share of the output, generated at 50 Hz, is excess to the country's needs and is being used by Brazil under a long-term agreement. After conversion to d-c at the convertor station at Foz do Iguacu, near the dam, the power is sent 800 km to an invertor station near the industrial center of Sao Paulo, where it is changed to 60-Hz a-c power and is transmitted at 345-kV for use in Southeastern Brazil. Brazil's share of the Itaipu power, generated at 60 Hz, is sent to Sao Paulo via three 750-kV series compensated a-c transmission lines. Shown above are incoming 500-kV lines to the convertor station at Foz do Iguacu.

Disruptions seen arising from nuclear rate shock

AFUDC, as an accounting factor, could be jeopardized

Dan Utroska
Associate Editor

BARRINGTON, IL——The rate shock associated with some of the 40-plus nuclear plants expected to come on-line in the next few years could seriously disrupt numerous local economies and could radically change the way certain crisis-state electric companies report their financial dealings.

These are the conclusions of two recent reports demonstrating that the potential effects of rate shock can be both direct and indirect.

The reports are *The Public Utility Industry: 1984 Survey of Financial Reporting and Accounting Developments* issued by Price Waterhouse, and *Rate Shock: Confronting the Cost of Nuclear Power*, released by the Environmental Action Foundation.

Rate shock is the impact of unconventionally high electric rates stemming from large plant additions into the rate base.

To the extent that the full cost of a large, expensive nuclear plant is passed along to ratepayers in the form of higher rates, it can result in a direct reduction in electricity demand and the corresponding flight of electricity consumers from the region.

To the extent that public utility commissions and electric utilities attempt to mitigate nuclear rate shock,

continued on page 6

Rep. Waxman, Sen. Byrd square off over future acid rain bill

WASHINGTON, D.C.——The push by House Democrats to pass acid rain legislation in the upcoming session of the U.S. Congress may come up against somewhat weakened opposition in the Senate, if remarks by two key legislastors are any indication of future positions.

In especially strong terms, Rep. Henry A. Waxman (D.CA) has charged that a policy of neglect on acid rain can only bring environmental and economic ruin to important segments of U.S. society.

"Ohio utilities have succeeded in avoiding stringent controls and want us to believe there is no cost to their pollution," he said. "Yet, everyone . . . knows that is not true."

Waxman, who was co-sponsor of the only piece of legislation that received serious attention in the 98th Congress, the Sikorski-Waxman bill (H.R. 3400), said that the cost of pollution created by Ohio utilities is being transferred to millions of Americans living east of that state.

Speaking to attendees of the Edison Electric Institute's seventh annual Power/Environment conference here, Waxman, who is chairman of the House Subcommittee on Health and the Environment, said, "Protecting the profits of utilities in one state by transferring their costs of doing business to other states is bad economics, bad policy, and just plain unfair. And it will not continue. Congress will not stand by and let our economy and environment be held hostage to the unreasonable wishes of some coal or utility companies."

Senator Robert Byrd (D., W.VA), the powerful Senate minority leader from a southern coal-producing state, has been successful in the past in snuffing out legislation coming from the House side. But Byrd told the same conference that he may not always be able to quash such efforts.

Declaring that there were others in the Senate who shared his view that the economic implications of proposed legislation have to be carefully evaluated, and that further scientific research was necessary before moving ahead with such legislation, Byrd said, "A few fingers in the dike will not be able to hold off the flood forever."

A new pragmatism?

Byrd said the acid rain debate may be entering a new phase in which the approach to dealing with the problem would be "more pragmatic."

"Proposals that make no provision at all for the tremendous economic dislocations they would cause are now viewed as far less desirable by many members of Congress," he said.

But he noted, "It is too early to know whether a new, more pragmatic approach to acid rain will emerge in the 99th Congress."

"In light of the incomplete and insufficient scientific data available at present, an acid rain plan that requires an expensive, intrusive, new regulatory program is not in the best interests of the United States," Byrd concluded.

Waxman repudiates the notion that current scienfitic data on acid rain is insufficient to support legislation. "Opponents of acid rain controls ignore the thoroughness of acid rain research and seem to hold an ideology that equates environmental protection with bad economics," he said. "But inaction is causing human suffering and costing our economy billions of dollars in economic damage."

While Byrd maintains that a 10-million-ton control plan would cause ratepayers to face dramatic rate increases, Waxman cites an estimate by the Congressional Office of Technology Assessment that calculates control costs of about $3 billion annually.

"But this figure must be evaluated

continued on page 37

EPA-driven audits, citizen suits mandate stricter environmental compliance

Corporate flexibility in complying with EPA regs is disappearing

WASHINGTON, D.C.——The push by the Environmental Protection Agency to encourage voluntary environmental audits by electric utilities, combined with a recent wave of citizens lawsuits aimed at forcing compliance with environmental laws, are forcing utilities to pay more attention to establishing and meeting technical environmental specificiations.

It is too early to assess the effect on utilities of the Reagan Administration's move to push for more rigorous environmental auditing. But there has been a surge in citizens lawsuits that, even if these do not actually result in demonstrably stricter compliance, can still work to energize certain EPA enforcement actions that may not have been started without the suits.

New audit initiative

"The agency believes . . . that investment in a structured effort to know how well your firm is meeting its environmental responsibilities will pay substantial dividends," EPA's Milton Russell told attendees at the Edison Electric Institute's Power/Environment Conference.

Russell, who is Assistant Administrator for Policy, Planning, and Evaluation, decried industry disinclinations to conduct such audits on the basis that they might reveal environmental problems that could threaten the utility's financial health.

"This head-in-the-sand attitude can mean disaster," he said.

Russell explicitly addressed utility managers who might be tempted to shrug off the importance of his message because it suggests voluntary actions rather than required ones. "When I offer supportive comments about voluntary compliance activities, that does *not* (emphasis supplied) imply a reluctance on the part of the EPA to enforce when enforcement is appropriate. Potential enforcement is a strong motivating factor."

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Foreign Power Briefs

Finalizing their $1.5 million agreement with a handshake, Southern Electric International President Harold C. McKenzie, Jr. (l.) and Ayhan Erkan, general manager of the Turkish Electric Authority (TEK), conclude the formalities of signing a new contract in which SEI will provide TEK with accounting and management information system consulting services.

• **The Turkish Electric Authority (TEK)** has hired Southern Electric International, Inc., the consulting company of the Southern Company, to analyze its accounting and management information systems. The consulting company also will implement technical improvements to strengthen TEK's financial reporting and operating functions. The World Bank provided the funding for the three-year, $1.3 million project. SEI President Harold C. McKenzie, Jr. said his firm will provide a base project team comprised of accounting and data processing experts who will work in cooperation with MAGE A.S., a diversified consulting firm based in Ankara.

• **Singapore** recently placed an order with Kraftwerk Union AG (KWU) for a turnkey gas turbine power plant. KWU said the two Jurong power station units will each have a maximum capcity of 130 MW. The first unit is scheduled to go into operation in June 1986.

• **The People's Republic of China** and the M.W. Kellogg Company have signed preliminary agreements that should result in a joint venture engineering company to be based in China and engaged in the engineering and construction of projects in China and elsewhere. M.W. Kellogg said it signed preliminary documents with Sino-Pec International in Bejing in September. Robert W. Page, chairman and chief executive officer of Kellogg Rust Inc., which owns M.W. Kellogg, said "We hope to form the strongest joint venture engineering company in China before the end of the year or early next."

• **Brazil's** Centrais Eletricas do Norto do Brasil S.A. obtained a $170 million medium-term loan from a group of 11 international banks, according to Manufacturers Hanover Trust. Eletronorte, the government-owned electric utility, will use the money for the Tucurui hydroelectric project in northern Brazil. The loan is for nine years and is priced at 1¾ points above U.S. prime at the lender's option.

• **The United Kingdom** and the United States have signed a memorandum of understanding for collaboration in energy research and development. The U.S. Dept. of Energy said the goals of the arrangement are to accelerate energy R&D and to increase R&D efficiency through joint planning. DOE said collaboration is initially planned for fossil fuels renewable energy sources and efficient energy use. DOE Secretary Don Hodel said, "Our two countries have a long history of successful cooperation in energy R&D, which provides a solid foundation for additional collaborative efforts going beyond historical cooperation. Collaboration as envisioned in this new arrangement could lead to greater efficiency through joint planning and a sharing of tasks, facilities, scientific and technical information, costs and human resources."

• **The Italian state electric utility**, Ente Nazionale Energia Elletrica (ENEL), has asked U.S. coal exporters to lower their prices, reports the *Journal of Commerce*. ENEL said it would buy American coal only if U.S. exporters brought down their prices to a level competitive with other exporting countries. ENEL says U.S. coal is approximately $5 per ton higher than its major competitors. In 1984 ENEL said it will import 8.35 million metric tons of coal, including 2 million from America. The Italian utility estimates that demand could jump to 16 million tons oil equivalent next year. ENEL claims it is the single largest importer of U.S. coal

• **Ontario Hydro** sold 739.8 million kilowatt-hours of electricity to the U.S. in September.

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Coal-generated electricity cheaper than nuclear: DOE

WASHINGTON—Electricity is being produced at lower cost in large coal-fired power plants than in nuclear plants, according to the latest survey reported by the U.S. Department of Energy.

The DOE results are in line with the most recent survey results reported by the Atomic Industrial Forum which also showed nuclear costs catching up to coal (see *EL&P*, November, 1984, page 11).

DOE said the generating cost for nuclear plants operating in 1983 was 33.46 mills per kWh compared to 31.83 mills for the coal plants. Generating cost includes actual reported fuel and O&M costs plus an estimated capital component based on a fixed charge rate of 18 percent.

The AIF survey pegged both types of costs for 1983 at 35 mills.

Nuclear costs rising faster

The cost studies are significant because they both show the cost of nuclear-produced electricity rising faster than that of coal. Nuclear electricity cost now equals or exceeds that of coal for the first time in the history of nuclear power in the U.S.

Over the last 3 years

Over the last three years nuclear costs in the DOE report have climbed from 26.15 mills per kWh in 1981 to 32.04 mills in 1982 and 33.46 mills in 1983. The DOE trend for coal has been a slower climb from 28.76 mills per kWh in 1981 (the last year coal costs exceeded those of nuclear in the DOE study) to 31.77 mills in 1982 and 31.83 mills in 1983.

In the AIF survey the nuclear cost rose from 23 mills in 1980 to 27 mills in 1981, 31 mills in 1982, and 35 mills in 1983. As with the DOE survey, the AIF survey showed coal-produced electricity costs rising at a slower rate, from 25 mills in 1980, to 32 mills in 1981, and to 35 mills in both 1982 and 1983.

O&M costs the culprit

The major factor in the shifting positions of coal and nuclear is the relative change in O&M costs, which are rising much more rapidly for the nuclear plants than for coal. In fact, coal plant O&M costs are the same as they were three years ago while nuclear O&M costs have climbed nearly 3 mills per kWh.

The DOE fee of 1 mill per kWh for nuclear waste disposal is included as part of the nuclear fuel cost, which has also been rising more rapidly than coal costs in the past few years. Capital costs, usually assumed to be the culprit in rising nuclear energy costs, have climbed at about the same rate for both generating types, according to the DOE survey.

Survey covers

The DOE survey covers all 55 operating nuclear plants larger than 400 MW and 105 base-loaded coal-fired plants larger than 400 MW. DOE says the nuclear units covered in the survey accounted for 78 percent of all nuclear generation and the coal units surveyed accounted for 29 percent of all coal-fired generation.

United Engineers and Contractors Inc. conducted the survey. Results were reported in the April-June 1984 issue of the DOE publication "Update: Nulcear Power Program Information and Data."

Manitoba pitches hydro power sales to midwest U.S. utilities

CHICAGO—The Canadian Province of Manitoba, located to the north of Minnesota and North Dakota, wants to "prebuild" potential hydroelectric generating capacity and sell the power on a firm basis to U.S. utilities.

Marc Eliesen, deputy minister of energy and mines for the Province of Manitoba gave a high-powered sales pitch aimed at midwestern U.S. utilities at the recent Illinois Energy Conference here sponsored by the University of Illinois.

"It makes economic sense for American utilities to consider importing Canadian electricity," said the Canadian government official. He claimed that in a recent deal signed with Northern States Power for 500 MW over 12 years the American utility's customers will pay 80 percent of what they would have paid for electricity from a new coal-fired plant built by NSP.

Manitoba Hydro makes money off the deal because it can produce electricity much more cheaply than U.S. utilities can, said Eliesen. He said Manitoba electricity customers currently pay half what NSP's customers do. He said Manitoba has the lowest electric rates in North America.

Manitoba currently has 4000 MW of hydro capacity operating chiefly in the Nelson River and Churchill River watersheds in the northern part of the province. A 560-mile, 450-kV transmission link was recently built to beef up ties between the hydro region in the north and the load centers in the south. The province has better ties to the south than it does east or west, said the official.

There is "vast potential" for further hydro development in Manitoba, Eliesen reported. He said there is at least 9000 MW more capacity to be developed.

The capacity now operating can handle Manitoba's internal needs well into the 21st century, said Eliesen, adding, "We are prepared to prebuild our system for export purposes."

"Let me assure you," says Manitoba government official Marc Eliesen, "Canadians are not blue-eyed sheiks."

Good track record

Manitoba has a proven export track record, said the official, based on 20 years of interruptible sales to midwestern U.S. utilities. The province's electricity exports have grown from 1.4 billion kWh in 1975 to 6.5 billion in 1983, accounting for one-third of Canadian exports to the U.S.

U.S. utilities need not be concerned about the reliability of supply from Manitoba, said Eliesen, adding, "Let me assure you Canadians are not blue-eyed sheiks."

Building on its experience with interruptible sales to U.S. utilities Manitoba is now moving into the area of long-term, firm sale agreements. So far an additional 10 billion kWh a year have been negotiated or are in the planning stage.

The first firm deal was signed last June with NSP. It calls for 500 MW for 12 years. Manitoba expects revenue from this agreement to total $3.2 billion.

Eliesen said discussions are currently underway with the Western Area Power Administration, a federal agency that serves midwestern public power companies, for 1200 MW over 35 years. If that deal goes through Manitoba will build a new, $3 billion hydro project.

The official said that discussions are also underway with two different groups of U.S. utility companies: a nine-utility group in North Dakota, Iowa, Minnesota, and Wisconsin; and an eight-utility group in Wisconsin, Minnesota, and North Dakota. Both discussions cover deals in the range of 1100 MW over 35 years.

There are in place a 230-kV transmission link to North Dakota and 230-kV and 500-kV ties to Minnesota. Manitoba is prepared to build new lines, said Eliesen. He recalled problems with T-line construction in a proposed 700-MW seasonal transfer deal between Manitoba and Nebraska. South Dakota denied permission to build the necessary line, setting back the project. Canada, Eliesen assured his U.S. audience, will not impose any regulatory delays on such deals.

"Despite impediments," said the official, "U.S. power sales will grow because they make good business sense."

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Total utility financing drops in 3rd quarter

NEW YORK—Total utility financing in the first nine months of 1984 was $7.1 billion, 47 percent lower than the $13.3 billion issued in the same period in 1983.

A report prepared by Ebasco Business Consulting Company electric utility financing dropped 29 percent to $6.5 billion from last year's nine-month total of $9.1 billion.

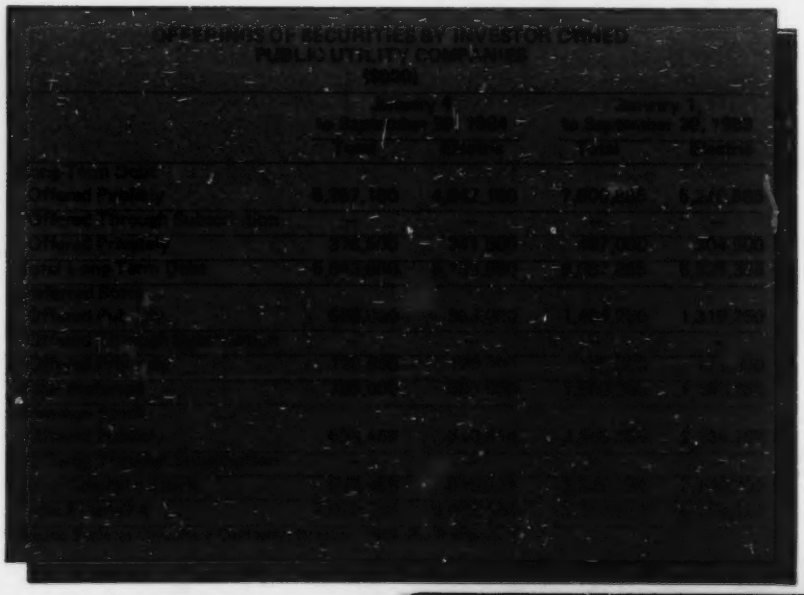
Long-term debt issued by electric utilities was $5.2 billion, down slightly from 1983's $5.5 billion. Ebasco said total long-term debt issued by all utilities decreased from $8.1 billion in 1983 to $5.6 billion in 1983.

Preferred financing

Preferred stock financing by electric utilities in the first nine months dropped to $688 million from $1.5 billion during the same period in 1983. Offerings of preferred stock by all utilities decreased 54 percent to $788 million from $1.7 billion.

Common stock

Common stock financing for electric utilities was approximately $610 million, a plummet of almost 71 percent from 1983's $2.1 billion. Common stock offerings for all utilities dropped from $3.5 billion to only $638 million in the first nine months of 1984.



EPRI produces book for HPOF cable designers

PALO ALTO, CA—Utilities can save considerable operating and capital costs by following the recommendations in EPRI's new forced-cooled transmission cable system handbook, said the institute.

EPRI said the handbook provides complete information for designing an optimized forced-cooled high-pressure oil-filled pipe-type cable system. The book presents a step-by-step procedure that a cable system designer familiar with cable ratings can use.

The EPRI handbook includes a discussion of the fundamentals of forced cooling, procedures for calculating and estimating design parameters, and guidelines for system engineering and equipment applications.

For more information on EPRI report *EL-3624*, contact the institute at (415) 965-4081.

Byron approved

WASHINGTON, D.C.—A Nuclear Regulatory Commission Atomic Safety and Licensing Board said in October that Commonwealth Edison should be allowed to operate the two unit 1,120 MW Byron nuclear plant.

The decision reversed the board's denial of an operating license last January because of quality assurance questions.

ASLB said

The ASLB said, "In today's supplemental initial decision we conclude that, with respect to those quality assurance issues within our jurisdiction, there is no impediment to an operating license."

Satisfied

When the Byron operating license was denied in January, Commonwealth Edison was in the midst of a $10 million reinspection program. After evaluating the reinspection program, the ASLB said it was satisfied with the plant's quality assurance program.

Commonwealth Edison had hoped to receive an operating license last February. A utility spokesperson told *EL&P* that the delay has added $100 million to the cost of the Byron plant.

Commercial operation

The spokesperson said Commonwealth Edison hopes to have the first unit in commercial operation in February 1985.

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Electricity bills surveyed by NARUC

WASHINGTON, D.C.—Consumers in the Northeast and New England have the highest electricity bills in the U.S., while those in the Northwest and Rocky Mountain regions of the country have the lowest, according to a recent survey.

The National Association of Regulatory Utility Commissioners (NARUC) said its sixth winter residential electric bill survey found that the nationwide cost of electricity is 7.67 cents per kilowatthour.

Customers in New York City, the most expensive service area, pay more than 15 cents per kWh. The least expensive area is Lewiston, ID, where customers pay approximately two cents per-kWh. See accompanying tables for the ten most expensive and least expensive service areas.

The NARUC report contains winter 1983-84 residential bill comparisons for the largest service territories of the major investor-owned electric utilities. NARUC looked at residential bills between December and February at three levels of energy consumption—250-kWh, 500-kWh and 750-kWh.

Compared to last years' survey, NARUC found that residential electricity bills jumped about 4.4 percent. This contrasts with an approximate 4.1 percent rise in the Consumer Price Index during the same period, said NARUC.

The study shows that in 26 service areas, consumers are paying in excess of 10 cents per-kWh while in 15 other service territories, they pay less than five cents per-kWh.

Other areas of the country where electric bills are high, include Nantucket, MA, (14.48 cents); and Hilo, HI, (13.18 cents). Low bills can be found in Rexburg, ID, (2.98 cents); Spokane, WA, (3.13 cents); and Kalispell, MT, (3.28 cents).

10 MOST EXPENSIVE BILLS

Company	City	State	Total bill*	Avg. cost cents/kWh	Nation rank
Consolidated Edison Co. of New York	New York City	New York	228.26	15.22	1
Nantucket Electric Company	Nantucket	Massachusetts	217.17	14.48	2
Hawaii Electric Light Co.	Hilo	Hawaii	197.75	13.18	3
Maui Electric Co.	Wailuku	Hawaii	197.50	13.17	4
Orange & Rockland Utilities, Inc.	Middletown	New York	194.21	12.95	5
San Diego Gas & Electric Co.	San Diego	California	183.80	12.25	6
Long Island Lighting Co.	Long Beach	New York	181.89	12.13	7
Central Hudson Gas & Electric Corp.	Poughkeepsie	New York	174.52	11.63	8
United Illuminating Company	Bridgeport	Connecticut	174.22	11.61	9
Hawaiian Electric Co.	Honolulu	Hawaii	171.17	11.41	10

10 LEAST EXPENSIVE BILLS

Company	City	State	Total bill*	Avg. cost cents/kWh	Nation rank
Washington Water Power Co.	Lewiston	Idaho	31.14	2.08	190
Utah Power & Light Co.	Rexburg	Idaho	44.73	2.98	189
Washington Watur Power Co.	Spokane	Washington	47.01	3.13	188
Pacific Power & Light Co.	Kalispell	Montana	49.13	3.28	187
Citizens Utilities Company	Kellogg	Idaho	53.43	3.56	186
Pacific Power & Light Co.	Yakima	Washington	56.55	3.77	185
Pacific Power & Light Co.	Portland	Oregon	57.12	3.81	184
Idaho Power Company	Ontario	Oregon	57.78	3.85	183
Idaho Power Company	Boise	Idaho	59.70	3.98	182
Portland General Electric Co.	Portland	Oregon	61.03	4.07	181

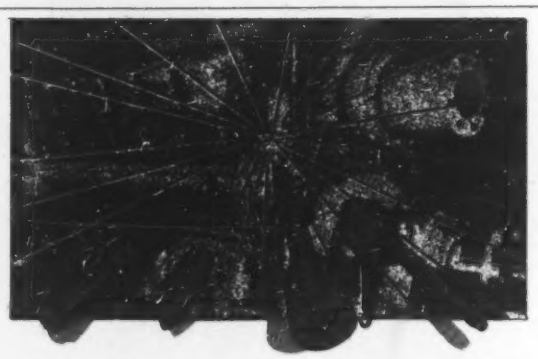
*Total bill equals cost of 900 kWh for the three months of December, 1983, January, 1984, and February, 1984.
Source: NARUC

Westinghouse says it will make changes

PITTSBURGH—Westinghouse Electric Corporation said it has reorganized its steam turbine-generator and plant operations division.

Eugene J. Cattabiani, power generation executive vice-president, also announced that Stanley L. Quick, general manager of the steam turbine-generator division, will retire in early 1985.

Westinghouse said Howard Pierce, general manager of the power generation operations division, who currently has responsibility for the unit's manufacturing operations in East Pittsburgh and Lester, PA, and Charlotte and Winston-Salem, NC, has been given the additional responsibility for steam turbine-generator engineering. Pierce also will serve as the site manager at Orlando.



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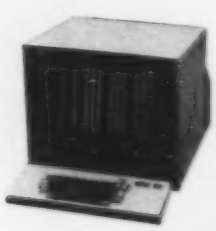

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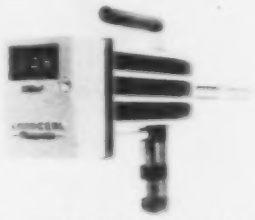

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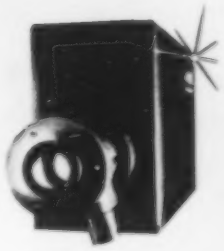

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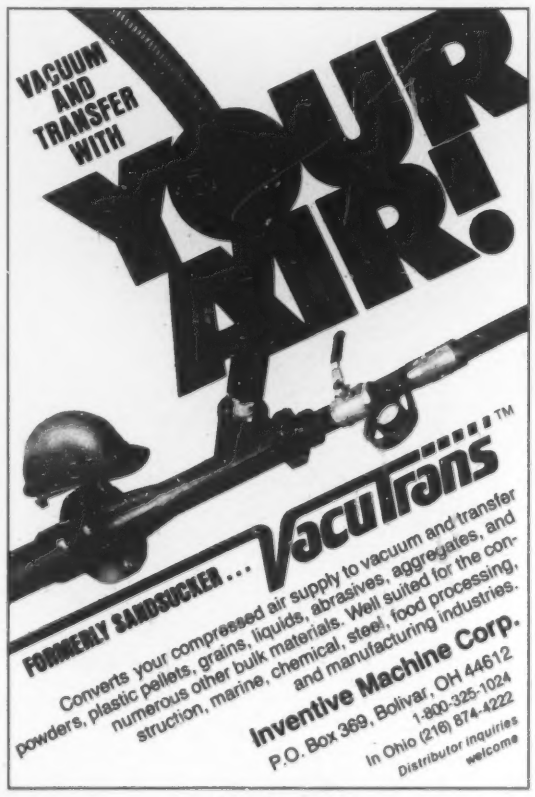
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